Journal of Psychosomatic Research 110 (2018) 24–31

Contents lists available at ScienceDirect

Journal of Psychosomatic Research

journal homepage: www.elsevier.com/locate/jpsychores

Psychiatric disorders among people living with HIV/AIDS in IRAN: Prevalence, severity, service utilization and unmet mental health needs

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ARTICLE INFO

Keywords:
HIV infection
Mental health
Psychiatric disorder
Health service utilization

ABSTRACT

Background: HIV and psychiatric disorders are closely correlated and are accompanied by some similar risk factors.
Objective: The aim of this study was to assess psychiatric comorbidity and health service utilization for mental problems among people living with HIV/AIDS in Iran.
Methods: A total of 250 cases were randomly selected from a large referral center for HIV treatment and care in Tehran, Iran. Psychiatric disorders in the past 12 months including mood, anxiety, and substance use disorders were assessed through face-to-face interview, using a validated Persian translation of the Composite International Diagnostic Interview (CIDI v2.1). Severity of psychiatric disorders, social support, socio-economic status, service utilization and HIV-related indicators were assessed.
Results: Participants consisted of 147 men and 103 women. Psychiatric disorders were found in 50.2% (95% confidence interval: 43.8–56.6) of the participants. Major depressive disorder was the most prevalent diagnosis (32.1%), followed by substance use disorders (17.1%). In bivariate analysis, psychiatric disorders were significantly higher among male gender, single and unemployed individuals and those with lower social support. In multivariate regression analysis, only social support was independently associated with psychiatric disorders. Among those with a psychiatric diagnosis, 41.1% had used a health service for mental problems and 53% had received minimally adequate treatment.
Conclusion: The findings of the study highlight the importance of mental health services in the treatment of people living with HIV/AIDS.

1. Introduction

There are 36.7 million people living with HIV/AIDS (PLWHA) in the world [1]. Although the annual incidence of HIV infection is decreasing globally, HIV prevalence is rising due to development of more effective treatment and higher survival [2]. Therefore, the health system is now facing emerging challenges of non-communicable diseases and mental health problems among PLWHA [3].

In Iran, there are about 35 thousand registered cases of HIV infection, identified through health care and surveillance systems [4]. In Iran, HIV prevalence in general population is 0.15% [5]. However, the country suffers from concentrated HIV epidemics among injecting and non-injecting drug users [6,7]. While the global burden of HIV/AIDS has been declining in the last decade [8], it is projected that the burden will continue to grow during the next 10 years in Iran [9]. HIV treatment and care is widely available in Iran [5], there are more than a thousand Voluntary Counseling and Testing (VCT) centers and 162 health facilities that provide anti-retroviral therapy (ART). In 2014, among those eligible for receiving ART, 20.1% were receiving it [5]. Psychosocial services for PLWHA and their families are provided through 48 “Positive Clubs” across the country [5].

HIV, psychiatric disorders and substance use disorders are closely correlated and are accompanied by similar risk factors. They also share common consequences such as stigma and discrimination [10]. Mental

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https://doi.org/10.1016/j.jpsychores.2018.04.012
Received 9 December 2017; Received in revised form 25 April 2018; Accepted 25 April 2018

illnesses and substance use disorders can act as risk factors for HIV acquisition [11–14]. Globally, injecting drug use is a major route of HIV transmission [1]. It accounts for 66% of the HIV cases in Iran [4]. Impaired judgment, diminished inhibition and engagement in high risk sexual behaviors, lack of insight, and poor self-care and neglecting physical health have been proposed as the underlying mechanisms [15].

On the other hand, HIV infection can serve as a risk factor towards development of psychiatric disorders [16,17]. Stressor of sero-conversion, chronic adjustment with a life-threatening disease, fear of stigma and discrimination, and CNS invasion of the virus as well as adverse effects of anti-retroviral (ARV) medications may all contribute to establishment of a psychiatric disorder [15,18].

Although there is a bi-directional correlation between mental disorders and HIV infection, this reciprocity goes beyond. Psychiatric disorders can affect the disease's course, clinical outcome and progression towards AIDS through disturbances in immune system modulation, poorer access to treatment and care, and lack of optimal treatment adherence [19–22].

There is scarcity of knowledge regarding mental health problems and service utilization of PLWHA in Iran. Moreover, literature in this regard lacks implementation of structured diagnostic tools. In this study, we examined prevalence, severity and correlated factors of psychiatric disorders in the past 12 months, as well as the pattern of health service utilization for mental disorders in a group of HIV patients in a main referral center for HIV treatment and care in Tehran, Iran.

2. Methods

This is a cross-sectional study on 250 randomly selected HIV^+ patients from the referral center for HIV treatment and care in Tehran, Iran. The study was approved by the Ethics Committee of Tehran University of Medical Sciences in Iran.

2.1. Field work and sampling

Participants who were 15–64 years of age, able to communicate in Persian language, physically and cognitively competent to complete the interview and whose HIV infection had been diagnosed at least four weeks prior to the interview were eligible for this study.

The study was conducted at the Imam Khomeini Hospital's HIV treatment and care center, from mid-2012 to early 2013. The center provides HIV counseling and testing as well as HIV treatment and care services (free of charge anti-retroviral treatment, CD4 count and viral load assessment). Systematic random sampling was applied for selecting the eligible participants. During the field work on each day, the first case was selected using a random number from the list of the referring clients and subsequent cases were recruited using a fixed interval. On each working day, an average number of three interviews were carried out from the center's 25 daily referrals. Those who refused to cooperate were substituted by cases matched by their gender and anti-retroviral regimen, whether receiving ART or not, on the same day. Participation in the study was voluntary and informed consent was obtained for the interview. Patients would not face any limitation in receiving services if they rejected participation in the study. Participants were welcomed with refreshments and a snack. Referral to free of charge mental health services, located at the same center, was provided upon request but no monetary incentive was given. All interviews took place in a private setting. All questionnaires and databases were kept confidential.

Interviewers consisted of three clinical psychologists, having prior experience in working with psychiatric patients and implementing similar questionnaires. They received intensive training during the preliminary phases of the survey about ethical issues, interview, process of sampling and field work. A quality control protocol was implemented in different stages of field work and data management. Participation rate was 93%.

2.2. Measures and instruments

We used a package of instruments which was adapted from the comprehensive battery used in the Iranian National Mental Health Survey (IranMHS) [23]. The paper and pencil version of questionnaires were filled out by interviewers through face-to-face interviews. The questionnaires used in this paper are as follows:

Composite International Diagnostic Interview (CIDI v2.1) was used to assess the prevalence of mental disorders over the past 12 months. The validity of the Persian version of CIDI has been previously evaluated [24]. The included diagnoses consisted of depressive disorders, bipolar disorders, panic with or without agoraphobia, agoraphobia, social phobia, generalized anxiety, obsessive-compulsive and post-traumatic stress disorder, and drug and alcohol use disorders. Illicit drugs included opioids, cannabis, stimulants, hallucinogens and inhalants. Bipolar disorders were assessed using the lifetime version of the instrument and others were evaluated using the past 12-month version. Somatoform disorders were assessed using a World Health Organization screening instrument recommended for primary care settings. Moreover, questions about suicidal ideation and attempts, and aggressive behavior were also included. History of perpetrating physical aggression in the past 12 months, including destruction of properties, physical violence towards family members or others were asked through four questions. Serious aggressive behavior was defined by either requiring medical treatment of the victim or leading to legal consequences.

Sheehan Disability Scale (SDS) was used to assess the degree of disability associated with the psychiatric disorders, in four domains of work performance, household responsibilities, social life and intimate interpersonal relationship. Psychometric properties of SDS have been assessed and have showed good reliability and validity indices [25]. We assessed the severity of psychiatric disorders based on the following definitions:

- Serious mental disorders consisted of either bipolar I disorder, physiological dependence to a substance; OR diagnosis of a mental disorder with severe impairment in two or more domains of functioning based on SDS; OR a suicidal attempt in the last 12 months in the presence of any psychiatric disorder;
- Moderate mental disorders were defined as a presence of a mental disorder with moderate impairment in at least two domains of SDS, or substance dependence without physiological dependence, and lack of criteria for serious mental disorders;
- Mild disorders were those which were neither serious nor moderate.

We assessed health and non-health service utilization for mental health problems by using a questionnaire previously developed and adopted in IranMHS. Health service utilization was defined as having accessed any healthcare provider including mental health professionals and general practitioners in the past 12 months. It consisted of hospitalization, outpatient service use, hotline and telephone counseling services, referring to pharmacist for refilling a physician's prescription and drug harm reduction services. Non-health services included alternative medicine (e.g. herbal medicine, acupuncture and pray-writers), attending self-help groups and direct referral to pharmacist without prescription. Minimally adequate treatment (MAT) for mental health services was derived from the definition used in World Mental Health Survey [26], as either having made at least two visits in the last twelve months, or having made a visit to the health-care system for a mental health issue in the past month.

Data on demographic characteristics, perceived social support and socio-economic status were also gathered. Regarding socio-economic status, participants were classified as high, moderate and low in equal proportions according to their household's specifications and assets

(based on an instrument used in a national health services utilization study [27]). The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure perceived social support and MSPSS has been validated in Persian language [28]. It consists of 12 seven-point Likert scale questions that assesses the participant's perception of social support from family, friends, and significant others [29]. As recommended, any mean scale score ranging from 1 to 2.9 was considered as low support, a score of 3 to 5 as moderate support, and a score from 5.1 to 7 as high support.

2.3. Statistical analysis

PASW 18 (SPSS Inc., Chicago, IL, 2010) and STATA (12.0 SE) software were used for statistical analysis. In addition to descriptive analyses (prevalence and 95% confidence intervals for psychiatric disorders and other mental conditions), bivariate and multivariate analyses were also conducted for determining correlates of any psychiatric disorder in the past 12 months. These included socio-demographic characteristics and HIV-specific variables (i.e. CD4 count, HIV disclosure status and social support) which were also assessed in other studies. *t*-Tests and chi-squared tests were used in bivariate model and logistic regression in the multivariate models. All variables showing significant correlations with the outcomes ($P \leq .2$ level of significance) in bivariate analysis were entered into a multivariate logistic regression model.

3. Results

From the total 250 participants 147 (59%) were male. The mean age of participants was 35.9 (± 8.9) with a range of 16–61. Among the participants, 110 (44.0%) were head of their household. Regarding marital status, 179 (71.6%) were either married or previously married and 113 (63.1%) had at least one child. Regarding education, 15.1% had primary education, 71.7% had high school education or more. A total of 131 (52.2%) participants were employed at the time of the interview, but only 80 (32.0%) were employed throughout the whole past 12 months. The average length of employment was 8.9 (± 4.0) months. The average length from the time HIV diagnosis was reported to be 6.1 (± 4.0) years. From the respondents, 192 (76.8%) were recommended to receive HAART medications and 184 (73.6%) were on treatment at the time of the study.

Table 1 describes prevalence of psychiatric disorders among participants. As shown in the table, 50.2% had at least one psychiatric disorder in the past 12 months, 52 (21.1%) had a single disorder, 39 (15.8%) had two disorders and 33 (13.4%) were found to have more than two psychiatric disorders. Serious disorders were quite prevalent, affecting 77.4% of those with a psychiatric diagnosis (38.2% of total respondents) and significantly higher in men. This pattern was observed across all psychiatric disorders.

Mood disorders were the most prevalent psychiatric comorbidity followed by anxiety disorders. The most prevalent psychiatric diagnosis was major depressive disorder, affecting 32.1% of participants. Generalized anxiety disorder was seen in 13.7% of the respondents.

Suicidal thoughts and attempts were commonly reported. One out of five reported having suicidal thoughts and 7% reported having an attempt in the past 12 months. Physical aggression was reported by 42.2% and serious aggressive behavior was mentioned by 7.8% of the respondents.

Participants were asked to identify their main substance of use in the past 12 months. Opioids were the most common and reported by 9.2% of participants followed by alcohol, amphetamine type stimulants and cannabis (6.8%, 5.6% and 1.2% respectively). Prevalence of substance use disorders (according to DSM-IV) based on CIDI was 17.1% (Table 2). No cases of hallucinogen and inhalant use disorders were found in this study. Intravenous drug use in the past 12 months and last month was mentioned by 5.6% and 2.4% of the participants, respectively.

In bivariate analysis, psychiatric disorders were more prevalent in men, those who were single (compared to married participants), unemployed and among those who had lower social support. Multivariate logistic regression analysis was used in order to assess possible confounding factors associated with mental health problems. As shown in Table 3, the only significant factor was lower social support.

Perceived need and health service utilization for mental problems are summarized in Table 4 and Fig. 1. Totally, 154 (62.3%) mentioned that they felt the need to seek help for mental problems in the past 12 months and 69 (27.5%) of the total sample were eventually referred for treatment.

From 122 patients with any psychiatric disorder, 98 (80.3%) perceived the need to seek professional help in the past 12 months. However, 51 (41.1%) received a health service for mental problems resulting in a total of 58.9% unmet mental health need. Unmet need did not significantly differ across age, gender, socio-economic status, perceived social support, CD4 count and different categories of psychiatric disorders. Although, those with a serious psychiatric disorder reported higher perceived need and health service utilization, the rates were not significantly different when comparing the severity of the disorders. In those with a psychiatric diagnosis who had received health services for their mental health problems in the past 12 months ($n = 51$), only 27 (53.0%) had received minimally adequate treatment, i.e. 22.1% of the total sample with any psychiatric disorder. The rates of minimally adequate treatment did not differ significantly across diagnostic categories and severity (Table 4).

Table 5 demonstrates specific types of health and non-health services used in the past 12 months. Non-health services were more frequently utilized than health services in the past 12 months and mainly consisted of self-help groups, directly referring to the pharmacy for prescription and alternative medicine.

In those who perceived the need to seek help for mental problems but had not utilized any service, we inquired about the reasons for refusal to seek treatment. The most common answers were considering the mental problem as either untreatable or transient, mentioned by 66.7% and 62.2%, respectively. Fear of discrimination and HIV-associated stigma was mentioned by 55% as the reason for refusal. Treatment for mental problems was believed to be unavailable or inaccessible by 24.7%.

4. Discussion

This study is among the very few and the first in Iran which implemented a structured diagnostic tool in order to assess the prevalence of mental disorders in PLWHA. A high prevalence of psychiatric disorders was found in this study. Just more than half had a history of any psychiatric disorder in the past 12 months, which according to the latest national mental health survey (IranMHS), is more than double the corresponding rate in adult general population (23.6%) [30]. Freeman and colleagues found an overall prevalence of 43.7 of psychiatric disorder among PLWHA using a similar method [31]. High rates of psychiatric disorders were also reported in two other studies implementing the CIDI instrument [32,33]. Compared with general population [30], mood disorders (especially major depressive disorder) and anxiety disorders (especially generalized anxiety disorder and post-traumatic stress disorder) were more than two times more prevalent than the general population. Again, compared with general population [34], suicidal ideation and attempt in the past 12 months were 3.4 and 5.2 times more prevalent, respectively. Physical aggression and serious aggressive behavior were also much higher than the general population (1.3 and 4.5 times higher, respectively).

In addition to few studies which have used a structured diagnostic tool to assess mental disorders, elevated rates of psychiatric disorders among PLWHA were reported in other studies using screening tools [16,35,36]. Bing et al. in a nationally representative sample of PLWHA

Table 1
Prevalence of psychiatric disordersand conditions in the past 12 months.

	Total		Female		Male	
	Number (%)	95% CI[a]	Number (%)	95% CI	Number (%)	95% CI
Any psychiatric disorder[b]	124 (50.2)	43.8–56.6	41 (40.6)	31.0–51.0	83 (56.8)	48.4–65.0
Mild	8 (3.2)	1.0–5.4	3 (2.9)	0–6.1	5 (3.4)	0.5–6.4
Moderate	20 (8.0)	4.6–11.4	8 (7.7)	2.5–12.9	12 (8.2)	3.7–12.7
Severe	96 (38.4)	32.3–44.5	30 (28.8)		66 (45.2)	37.1–53.3
Any anxiety disorder	77 (30.7)	24.9–36.4	27 (26.0)	17.5–34.5	50 (34.0)	26.3–41.7
Panic with or without agoraphobia	15 (6.0)	3.0–9.0	4 (3.8)	0.1–7.6	11 (7.6)	3.2–11.9
Agoraphobia without panic	3 (1.2)	0.0–2.6	2 (1.9)	0.0–4.6	1 (0.7)	0.0–2.0
Social phobia	11 (4.4)	1.8–6.9	4 (3.8)	0.1–7.6	7(4.8)	1.3–8.2
Generalized anxiety disorder	34 (13.6)	9.3–18.9	9 (8.7)	3.2–14.1	25 (17.1)	11.0–23.3
Obsessive-compulsive disorder	26 (10.4)	6.6–14.2	10 (9.6)	3.9–15.3	16 (10.9)	5.8–16.0
Post-traumatic stress disorder	22 (8.8)	5.2–12.3	9 (8.7)	3.2–14.1	13 (8.8)	4.2–13.5
Any mood disorder	86 (34.5)	28.6–40.5	32 (30.8)	21.8–39.7	54 (37.2)	29.3–45.2
Any depressive disorder	80 (32.1)	26.3–38.0	30 (28.8)	20.1–37.6	50 (34.5)	26.7–42.3
Major depressive disorder	80 (32.1)	26.3–38.0	30 (28.8)	20.1–37.6	50 (34.5)	26.7–42.3
Dysthymia	1 (0.4)	0.0–1.2	0 (0)	0	1 (0.7)	0.0–2.0
Bipolar I disorder	6 (2.4)	0.5–4.3	2 (1.0)	0.0–2.9	4 (3.4)	0.4–6.4
Any alcohol/drug use disorder	43 (17.1)	12.4–21.8	10 (9.6)	3.9–15.3	33 (22.4)	15.6–29.2
Any alcohol use disorder	10 (4.0)	1.5–6.4	3 (2.9)	0.0–6.1	7 (4.8)	1.3–8.2
Alcohol dependence	8 (3.2)	1.0–5.4	2 (1.9)	0.0–4.6	6 (4.1)	0.9–7.3
Alcohol abuse	2 (0.8)	0.0–1.9	1 (1.0)	0.0–2.9	1 (0.7)	0.0–2.0
Any drug use disorder	35 (13.9)	9.6–18.3	7 (6.7)	1.9–11.6	28 (19.0)	12.6–25.4
Any drug dependence	30 (12.0)	7.9–16.0	5 (4.8)	0.7–9.0	25 (17.0)	10.9–23.1
Any drug abuse	6 (2.4)	0.5–4.3	2 (1.9)	0.0–4.6	4 (2.7)	0.07–5.4
Suicidal thought	53 (21.3)	16.2–26.4	21 (20.4)	12.5–28.2	32 (21.9)	15.2–28.7
Suicidal attempt	17 (6.8)	3.7–10.0	7 (6.8)	1.9–11.7	10 (6.8)	2.7–11.0
Physical aggression	105 (42.2)	36.0–48.3	37 (35.9)	26.6–45.3	68 (46.6)	38.4–54.7
Serious physical aggression	19 (7.8)	4.4–11.2	2 (2.0)	0.0–4.8	17 (11.8)	6.5–17.1
Any somatoform disorder[c]	13 (5.2)	2.4–8.0	8 (7.7)	2.5–12.9	5 (3.4)	0.5–6.4

[a] CI = Confidence Interval.
[b] Psychiatric disorders consist of anxiety, mood or alcohol/substance use disorders.
[c] Not included in the definition of "any psychiatric disorder".

in the United states found that nearly half screened positive for a mental problem [37]. Other studies have also found high rates of psychiatric disorders among PLWHA [17,38,39]. In an Iranian study on a sample of PLWHA, almost all participants had a mental illness based on a screening instrument [40].

Psychiatric disorders were independently associated with perceived social support. The role of perceived social support on the mental well-being of PLWHA has been demonstrated in other studies as well [41,42]. However, age, gender, level of education, marital status, employment, HIV disclosure and CD4 count did not seem to have an independent effect. Among the mentioned variables, CD4 count also seems to be of great clinical significance and is somehow considered as an illness defining factor. Some studies have proposed correlation of mental disorder with CD4 counts especially CD4 < 200 [43,44]. Whereas other studies have failed to show a correlation between CD4 count and mental health disorders [45].

In this study, psychiatric disorders were more frequently found in men (Crude OR = 1.92, 95% CI: 1.15–3.26). This is in contrast with the findings from the national survey (IranMHS) which found them to be more prevalent in women [30]. Some other studies have also proposed that in chronic conditions such as cancers, the rates of psychiatric disorders might not be significantly different in the two sexes [46].

As mentioned earlier, most of those with any psychiatric disorder (77.4%) suffered from a serious mental illness. The findings of the current study can be compared to the findings of the national Mental Health Survey (IranMHS) in which almost one-thirds (34.3%) of individuals with a mental disorder had a serious illness [30]. The observed numbers indicate that psychiatric disorders are not only more prevalent, but also more severe. The greater severity of psychiatric disorders among PLWHA further emphasizes on the need of provision of more intensive mental health services.

Again, compared with general population, the prevalence of

Table 2
Prevalence of substance use and use disorders (according to DSM-IV-TR) based on CIDI (N = 250).

Type of substance	≥ 5 times substance use in the past 12 months		substance abuse in the past 12 months		substance dependence in the past 12 months		substance use disorders in the past 12 months (DSM-IV)	
	Number (%)	95% CI[a]	Number (%)	95% CI	Number (%)	95% CI	Number (%)	95% CI
Opioids	31 (12.4)	8.3–16.5	1 (0.4)	0.0–1.2	23 (9.2)	5.6–12.8	24 (9.6)	5.9–13.2
Cannabis	6 (2.4)	0.5–4.3	1 (0.4)	0.0–1.2	2 (0.8)	0.0–1.9	3 (1.2)	0.0–2.5
Stimulants[b]	24 (9.4)	5.9–13.3	5 (2.0)	0.3–3.7	19 (7.6)	4.3–10.9	24 (9.4)	5.9–13.3
Any illicit drug without alcohol	44 (17.6)	12.8–22.4	6 (2.4)	0.5–4.3	30 (12.7)	7.9–16.0	35 (14.0)	9.7–18.3
Alcohol	24 (9.6)	5.9–13.3	2 (0.8)	0.0–1.9	8 (3.2)	1.0–5.4	10 (4.0)	1.5–6.4
Any substance	67 (26.8)	21.3–32.3	8 (3.2)	1.0–5.4	36 (14.3)	10.0–18.7	43 (17.1)	12.4–21.8

[a] CI = Confidence Interval.
[b] Stimulants = Amphetamine-type stimulants and cocaine.

Table 3
Regression analysis of factors associated with mental disorders in the past 12 months.

Variables	Any psychiatric disorder in the past 12 months				
	Number (%)	Crude odds ratio (95% CI[a])	*P* value	Adjusted odds ratio (95%CI)	P value
Sex					
Female (*n* = 101)	41 (40.6)	1	0.012	1	0.12
Male (*n* = 146)	83 (56.8)	1.93 (1.15–3.23)		1.64 (0.87–3.09)	
Age					
15–29 (*n* = 59)	26 (44.1)	1	0.51		
30–49 (*n* = 167)	87 (52.7)	1.41 (0.78–2.57)		–	–
50–64 (*n* = 21)	10 (47.6)	1.51 (0.43–3.13)			
Marital status					
Married (n = 122)	51 (41.8)	1	0.026	1	
Single (*n* = 72)	44 (61.1)	2.18 (1.21–3.97)		1.22 (0.61–2.45)	0.57
Previously married (*n* = 53)	29 (54.7)	1.68 (0.88–3.22)		1.18 (0.57–2.45)	0.65
Education					
High school and higher education (*n* = 180)	82 (46.6)	1		1	
Middle school and lower education (*n* = 71)	42 (59.2)	1.66 (0.95–2.90)	0.07	1.61 (0.88–2.95)	0.13
Employment					
Employed (*n* = 205)	93 (45.4)	1	0.001	1	0.053
Unemployed (*n* = 42)	31 (73.8)	3.39 (1.62–7.12)		2.23 (0.99–5.01)	
Socio-economic status					
Low (*n* = 65)	32 (49.2)	1	0.51		
Middle (*n* = 83)	43 (51.8)	1.11 (0.58–2.12)		–	–
High (*n* = 77)	33 (42.9)	0.77 (0.40–1.50)			
Disclosure					
No (n = 25)	14 (56.0)	1	0.54	–	–
Yes (*n* = 222)	110 (49.5)	0.77 (0.34–1.77)			
CD4					
< 200 (*n* = 63)	31 (49.2)	1	0.77	–	–
200–350 (*n* = 57)	32 (56.1)	1.32 (0.64–2.71)			
351–500 (n = 59)	29 (49.2)	0.99 (0.49–2.03)			
> 500 (*n* = 62)	29 (46.8)	0.91 (0.45–1.83)			
Perceived social support					
High (*n* = 84)	33 (39.3)	**1**	**0.001**	**1**	
Moderate (*n* = 129)	68 (52.7)	**1.72 (0.99–3.01)**		**1.64 (0.92–1.94)**	**0.09**
Low (*n* = 26)	21 (80.8)	**6.49 (2.23–18.91)**		**6.15 (1.98–19.05)**	**0.002**

The numbers in bold type show statistically significant results.
[a] CI = Confidence Interval.

Table 4
Demand and service utilization across different psychiatric diagnoses and severity of disorders.

Psychiatric Disorder	Perceived need to seek professional help for mental health in the past 12 months		Any health service utilization for mental health in the past 12 months		Receiving minimally adequate treatment for mental disorders	
	Number (%)	95% CI[a]	Number (%)	95% CI	Number (%)	95% CI
Total (*N* = 247)	154 (62.3)	56.3–68.4	69 (27.5)	21.9–33.1	30 (12.1)	8.0–16.2
Any psychiatric disorder (*n* = 122)	98 (80.3)	73.2–87.4	51 (41.1)	32.4–49.9	27 (22.1)	14.7–29.6
Mood disorders (*n* = 84)	75 (89.3)	82.6–96.0	38 (44.2)	33.6–54.8	20 (23.8)	14.6–33.0
Anxiety disorders (*n* = 75)	63 (84.0)	75.6–92.4	36 (46.8)	35.5–58.0	22 (29.3)	18.9–39.8
Alcohol/substance use disorders (*n* = 43)	38 (88.4)	78.6–98.1	18 (41.9)	26.9–56.9	8 (18.6)	6.8–30.4
Mild disorder (n = 7)	6 (85.7)	57.6–100	3 (37.5)	1.5–73.5	1 (14.3)	0–42.6
Moderate disorder (n = 20)	13 (65.0)	43.4–86.6	5 (25.0)	5.4–44.6	2 (10.0)	0–23.6
Serious disorder (*n* = 95)	79 (83.2)	75.6–90.7	43 (44.8)	34.6–54.8	24 (25.3)	16.4–34.1

[a] CI = Confidence Interval.

substance use disorders was found to be higher in this study. Opioids were main drug of use which is similar to the country's drug use scene. Almost all patterns of illicit drug and alcohol use in the past 12 months including > 5 times use, substance abuse and substance dependence were found to be more than four times higher among PLWHA than the general population [47,48]. Substance use disorder in PLWHA has been the focus of attention for its possible role in treatment adherence and thus the outcome of the infection [21,49]. Regardless of the impact of substance use disorders on adherence, the authors believe that the high rates of substance use disorders and injecting drug use in the study population should herald the need to give specific attention to drug treatment and harm reduction services in the treatment and care of PLWHA.

Another intriguing finding of this study was low rate of health service utilization for mental problems. Among those who were diagnosed with any psychiatric disorder in the past 12 months, almost 41% had utilized a health service in the same period and only 22% had received minimally adequate treatment. Mental health service utilization has been reported to be relatively low in other studies, as well [32,50] [32]. We also found high rates of non-health service utilization for mental disorders (64.5%) (mainly referring to pharmacy and self-help group) which is much higher than the similar rate in those with a psychiatric disorder in general population (38.4%) [34]. This might be partially justified by high rates of substance use disorders among

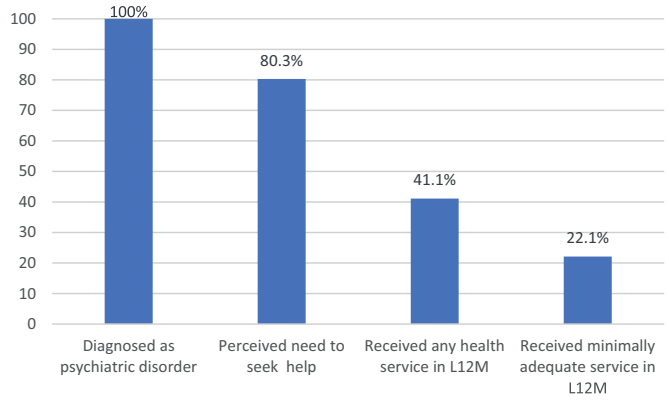

Fig. 1. Cascade of mental health care utilization among PLWHA with a psychiatric disorder.

PLWHA. The authors would like to emphasize that the observed low rate of health service utilization for a mental problem was among the active clients of a referral HIV treatment and care center. This highlights the need for improvement of mental health treatment and care for PLWHA. Several strategies can be used to improve mental health care for PLWHA. Using self-rated screening tests, training of the health care staff who are working with the PLWHA on identification of mental health problems, setting up responsive referral infrastructure and integration of mental health services into treatment and care of PLWHA. Similar HIV treatment and care which is free of charge, mental health care should be provided in a free or affordable manner. Since social support was a significant factor correlated to mental health, promotion of self-help groups and providing social services might promote mental health status among PLWHA. The so-called "Positive Clubs" in the country have set good examples of self-help groups, trying to empower the clients and provide a range of supportive social services for PLWHA and their partners [51].

Participants were mostly 30–39 years of age, married, employed and had high school education. Regarding the gender distribution, women consisted 41% of the sample. According to the latest national report in 2017, the male/female ratio among registered cases of HIV is 5.4. The same report states a rapid increase of HIV incidence among women since 2007 [4]. Women might consist up to one third of the total estimated new cases of HIV infection. Authors believe that higher than expected rates of female participants in the study might be due to higher HIV service utilization among women.

The study benefited from implementing a structured diagnostic tool to assess prevalence of psychiatric disorders among participants. The study achieved a high participation rate. It might be due to the fact that the interviewers were clinical psychologists and were able to establish good rapport with the clients. The clients also had to spend quite some time at the VCT center, waiting for their HIV treatment and care appointments. This might have also raised their participation in the study.

This was a cross-sectional study and was not able to reveal causal relationship between HIV and psychiatric disorders. In addition, we selected several common mental disorders for assessment in this study (mood, anxiety and substance related disorders) and were not able to assess psychotic disorders, simple phobias and some other disorders. Moreover, including participants from active clients of an HIV treatment and care center without reaching out to other patients could be considered as another study limitation. Although the center was an academic referral one, generalizing the findings should be done with caution.

Considering the long-term and the chronic nature of HIV infection and the associated psychiatric disorders, future longitudinal studies could shed more light on how service delivery might influence the course of the disease and provide more detailed picture of different domains of functioning.

5. Conclusions

In conclusion, we found a high rate of psychiatric disorders among PLWHA, the majority of whom were suffering from a serious mental illness. Despite these findings, health service utilization and receiving minimally adequate treatment for mental health problems remain drastically suboptimal. Based on the observed discrepancy between mental health need and service utilization, authors would like to emphasize that mental health services should be promoted in the country. The findings of this study can also have implications in better treatment and care of PLWHA.

Source of support

The study was funded by the Iranian Ministry of Health through contract number 91-130-221 with Tehran University of Medical Sciences.

Table 5
Service utilization for mental problems in the past 12 months.

	Total sample (n = 250)		Any psychiatric disorder (n = 122)	
	Number (%)	95% CI[a]	Number (%)	95% CI
Any perceived need to use health care services	154 (62.3)	56.3–68.4	98 (80.3)	73.2–87.4
Any health and non-health service use	145 (74.4)	68.2–80.5	91 (79.1)	71.6–86.6
Health service use	69 (27.5)	21.9–33.1	51 (41.1)	32.4–49.9
Outpatient treatment	45 (17.9)	13.2–22.7	36 (29.0)	21.0–37.1
Drug treatment center	7 (2.8)	0.7–4.8	7 (5.6)	1.5–9.7
Other health centers	38 (15.1)	10.7–19.6	29 (23.4)	15.9–30.9
Pharmacy for refilling physicians' prescriptions	24 (9.8)	6.0–13.5	18 (14.8)	8.4–21.1
Hospital admission	5 (2.0)	0.3–3.7	5 (4.0)	0.5–7.5
DICs[b]	11 (5.6)	2.3–8.8	10 (8.8)	3.5–14.0
Non-health service use in L12 M	131 (52.2)	46.0–58.4	80 (64.5)	56.0–73.0
Self-help group	55 (27.8)	21.5–34.1	38 (33.3)	24.6–42.1
Pharmacy for prescription of medication[c]	62 (25.2)	19.7–30.7	42 (34.4)	25.9–42.9
Residential drug services (camps)[d]	1 (0.4)	0.0–1.2	1 (0.8)	0.0–2.4
Alternative medicine	52 (20.8)	15.7–25.9	29 (23.6)	16.0–31.1

[a] CI: Confidence interval.
[b] DICs: Drop-In Centers.
[c] In Iran, pharmacists are not allowed to prescribe medications. Therefore, it is classified as a non-health service.
[d] These residential services are run by self-help groups.

Competing interest

None.

Conflict of interests

None.

Acknowledgements

Authors would like to express their gratitude to Ms. Fahima Farrahi, Ms. Leila Moazami and Ms. Farideh Kolahi for data collection in this study. Authors state that there are no conflicts of interest regarding this study.

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